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4619820, B9404-1130B-068, C9404-7410D-159; 940309.

Title
Single-layer global routing.

Author(s)
Sarrafzadeh-M; Kuo-Feng-Liao; Wong-C-K.

Author affiliation
Dept of Electr Eng & Comput Sci, Northwestern Univ, Evanston, IL, USA.

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ISSN
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Publication year
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Publication type
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Treatment codes
P Practical; X Experimental.

Abstract
We introduce the single-layer global routing problem (SLGRP), also called homotopic routing or rubber-band-equivalent routing, and propose a technique for solving it. Given a set of nets, the proposed technique first determines the routing sequence based on the estimated **congestion,** the bounding-box length and priority. Then, it finds a routing **path,** being a sequence of tiles, for each net (one net at a time), avoiding "congested" areas. The overall goal of the algorithm is to maximize the number of routed nets. The proposed global router is the first true single-layer global router ever reported in the literature. The size of tiles, w*w, is an input parameter in our algorithm. For w=1, the proposed global router serves as an effective detailed router. An optimal postprocessing algorithm, minimizing wire length and number of bends, under homotopic transformation, is presented. The technique has been

implemented and tried out for randomly generated **data.** The algorithm is very efficient and produces good results. (37 refs).

Descriptors

circuit-layout-CAD; network-routing; VLSI.

Keywords

single layer global routing; SLGRP; homotopic routing; rubber band equivalent routing; routing sequence; **congestion map;** bounding box length; routing **path;** tile sequence; algorithm; routed net maximization; tile size; optimal postprocessing algorithm; wire length; homotopic transformation; VLSI layout; Density Algorithm.

Classification codes

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B1130B    (Computer-aided circuit analysis and design).
B2570     (Semiconductor integrated circuits).
C7410D    (Electronic engineering).
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